

TESTING THE CITIZEN CAIN OF MARKETING CLAIMS: JUST HOW MANY LICKS DOES IT TAKE TO REACH THE CENTER OF A TOOTSIE POP?

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ABSTRACT

Commercial TV messages can endure beyond their broadcast dates. One in particular, dating back to the late 1960's / early 1970's, involves an animated commercial for Tootsie Pops and a young boy trying to find out how many licks it takes to reach the candy center. While the conclusion in the commercial was undetermined, students at several educational institutions have undertaken studies to discover the true answer. These previous studies however, involved flaws in either their methodology or controls. The current paper takes up the issue and presents a more controlled study to determine an accurate average number for licks to the center as well as discuss how robust the result truly is.

INTRODUCTION

Historically, researchers have examined the volume of advertising messages directed or observed by children from very early ages through their adulthood – including the impact on their development and socialization. (John, 1999). With the more recent advent of social media platforms and the internet, the number of advertising messages people born in the last decade have been exposed to has only risen.

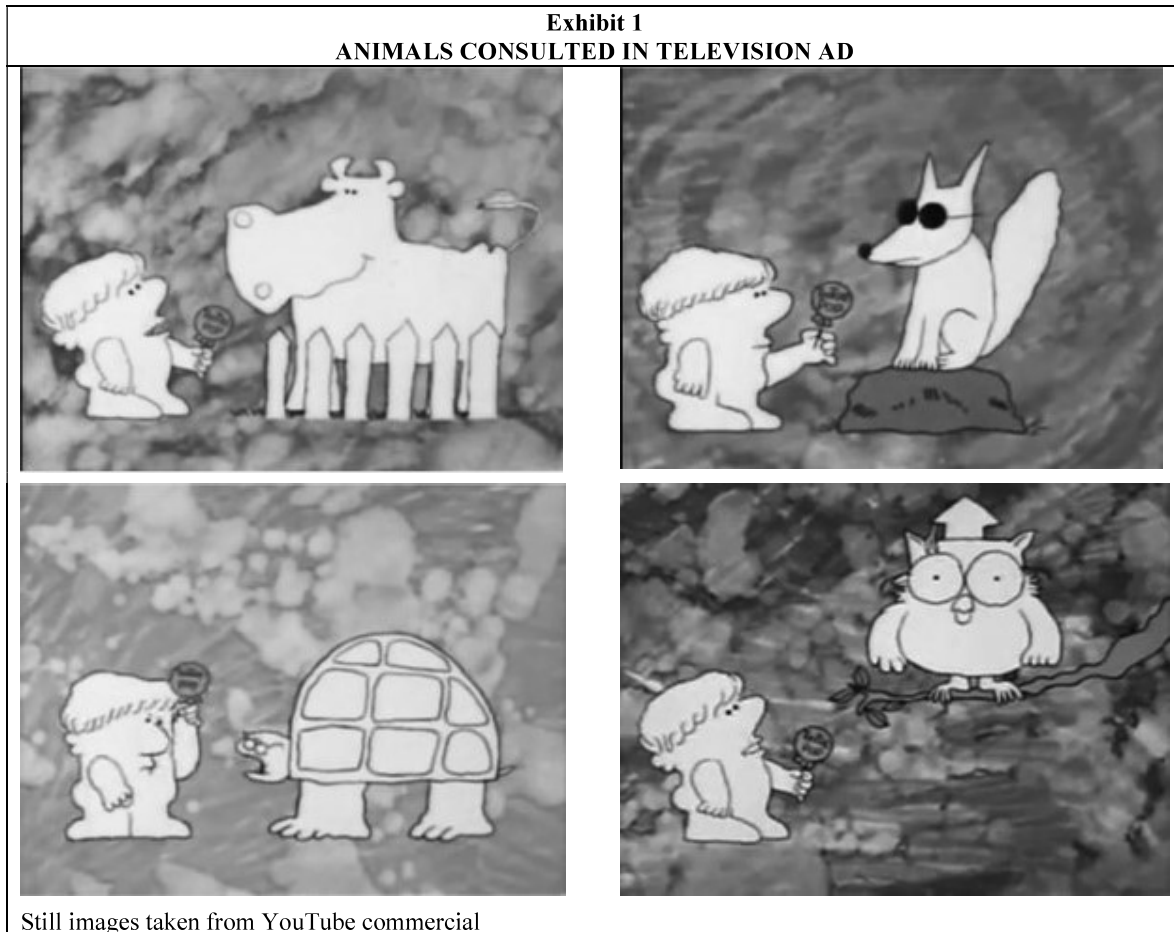
Among all the different media individuals are exposed to, broadcast television holds a particularly significant role for marketers – both in establishing brand preferences and loyalty to creating a foothold in consumers' mental spaces. Given the totality of messages competing for these spaces within consumers most would hypothesize that older messages would not be particularly accessible. Some commercial messages however, transcend their limited runs on television. Whether stories told through recollections of parents, dusty VCR videotapes, YouTube, or television shows that replay vintage commercials, some endure and can be recalled by people who were never exposed to the message during the commercial's original run of airings. Certain commercials are by their nature "sticky" in the minds of individuals (Health and Heath, 2007).

Apple, Inc.'s 1984 television ad has been hailed as a landmark in marketing (YouTube, 2012). Commercial spokespersons ranging from Madge the Palmolive lady (YouTube, 2008) to Mr. Whipple of Charmin toilet paper (YouTube, 2017) both exhibit sticky characteristics. These and many others can be recalled by people of a certain age. The true test is familiarity beyond when they were originally used in campaigns.

One such commercial was for the candy Tootsie Pop. In 1969 there was a now famous, and famously recallable, animated ad run primarily during Saturday morning television cartoons in the United States. The commercial asked the supposedly simple question, "How many licks does it take to get to the center of a Tootsie Pop." After consulting several animals for the answer (see exhibit 1) the young boy asked the wise, old owl. Giving up relatively early in his experiment the owl provided the answer "three". The premise of the ad was that consumer behavior is such that no one can get through a Tootsie Pop without biting through to the candy center. It's just too good and the temptation is too

great. It was left to the commercial's voice-over announcer to state that "the world may never know" (YouTube.com, 2012).

Over the years a number of groups have attempted to answer the question that the commercial did not through empirical testing. Their respective approaches as well as their results varied substantially.



BACKGROUND

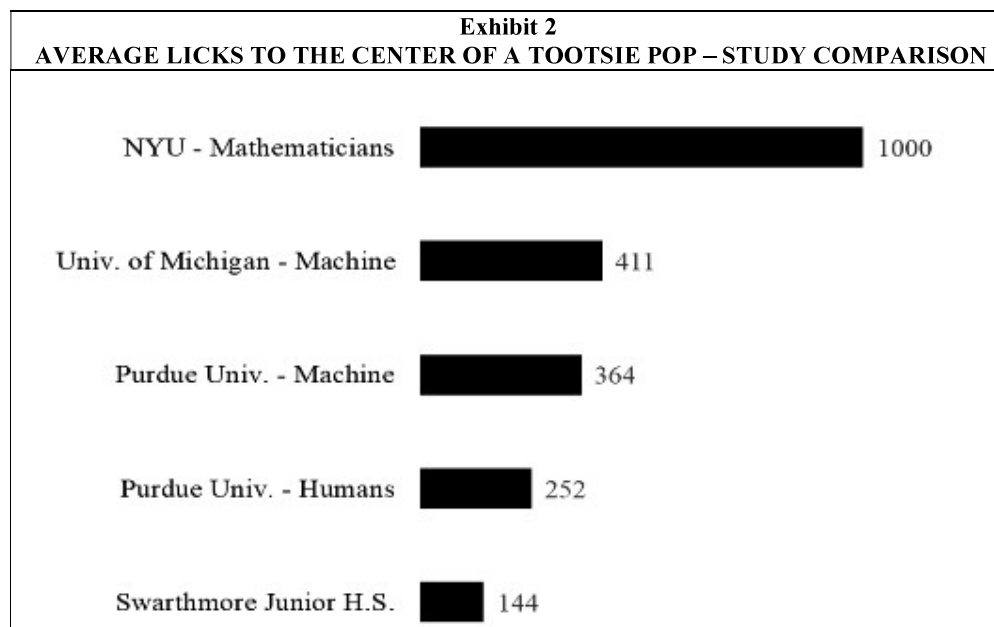
Exhibit two presents a comparison of the conclusions reached by various groups who have attempted to answer the Tootsie Pop question. At Purdue University students in the engineering college designed and constructed a licking machine, modelled after a human tongue. The result of their research reported that an average 364 licks was needed to reach the center (Tootsie Roll Industries website, 2020). As a parallel test they recruited twenty volunteers to perform a non-machine version of the task and arrived at an average of 252 licks to the center. Results from the human test represented an almost 31% difference from the machine test however no explanation was provided. Further there was no discussion of gender or other variables on the human side (Tootsie Roll Industries website, 2020).

Another machine-based approach was used by a doctoral student in chemical engineering at the University of Michigan. That research, employing a customized licking machine required 411 licks to reach the center of a Tootsie Pop (Tootsie Roll Industries, 2020). Utilizing a human subject approach, a 1996 study by students at Swarthmore Junior

High School, reported an average of 144 licks, with a range of 70-222 licks needed (Tootsie Roll Industries, 2020).

Finally, mathematicians at New York University conducted an experiment to find out exactly how many licks it takes to get to the center of a Tootsie Pop (Huang, Moore, and Ristroph, 2015). Graduate student Jinzi Mac Huang and associates determined it would take approximately 1,000 licks to make it through one centimeter of candy, which is approximately half the length of one Tootsie Pop. The study was done to explore the effects of dissolving materials within a fluid flow, such as rocks in geological environments and pills for pharmaceutical applications however the authors believed that the approach could be used on any material to figure out how fluids would dissolve it. Using that model and a giant homemade ball of candy, they got to the rough estimate of 1,000 licks, though the study researchers weren't able to test out the theory themselves. Unfortunately the candy they made for testing was not specified and no formula was shared with the researchers by Tootsie Pop Industries.

The overall conclusion of these various efforts is that albeit well intentioned, understanding consumer behavior requires more than building human analog machines or involving human beings without exploring the methods used to control for extraneous factors.



METHODOLOGY

Sample




To see if the results could be improved upon (or verified), instructors in the Business School at a medium-sized, private university in the South took on the challenge. An experiment was conducted using over 130 students. Each was given the envious task of getting to the center of a Tootsie Pop. Participants completed a survey comprised of a number of questions including their gender, time of the class, and the time they last ate. They were also asked about their eye color, hand orientation (left-dominant, right-dominant, or ambidextrous).

Method

A one-page, two-sided paper and pencil survey form was administered to all students which included a self-reported accounting sheet of the number of licks they made before reaching the center. Each student randomly selected one of three flavors of Tootsie Pops (raspberry, grape, or orange) by choosing from a brown paper bag passed around the room. These three flavors are among the ones featured in the original television commercial. While undertaking the project students were shown humorous slides of media advertisements as a low-level distraction activity while they licked the pops. This exercise was chosen because it did not take much concentration, the students could keep their minds on the task at hand. The researchers used a timer, revealing to students the time elapsed when they raised their hands signifying the conclusion of the task.

RESULTS

As can be observed in Table 1, the random drawing process yielded an approximately equal spread among the three flavors. Further, although the four sections of the class were held throughout the same day, total enrollment and the gender splits were approximately equal across all four sections.

Table 1 AVERAGE NUMBER OF LICKS AND TIME TO CENTER OF A TOOTSIE POP						
	 Grape (n=41 / 32%)		 Orange (n=44 / 34%)		 Raspberry (n=42 / 32%)	
All subjects (n=130 / 100%) 175 licks, 14.1 minutes	198 licks	15.5 min.	148 licks	12.3 min.	181 licks	14.5 min.
Male subjects (n=64 / 49%) 187 licks / 14.3 minutes	195 licks	15.2 min.	167 licks	12.8 min.	195 licks	15.9 min.
Female subjects (n=66 / 52%) 164 licks / 13.8 minutes	199 licks	15.8 min.	138 licks	12.5 min.	160 licks	13.3 min.
8:00 a.m. subjects (n=33 / 25%) 209 licks / 17 minutes	241 licks	17.5 min.	194 licks	15.7 min.	191 licks	16.8 min.
9:25 a.m. subjects (n=31 / 24%) 153 licks / 14 minutes	150 licks	13.9 min.	153 licks	12.2 min.	154 licks	14.5 min.
12:15 p.m. subjects (n=34 / 26%) 162 licks / 13 minutes	154 licks	13.7 min.	134 licks	9.6 min.	187 licks	14.6 min.
3:00 p.m. subjects (n=32 / 25%) 177 licks / 13 minutes	132 licks	16.6 min.	104 licks	11.1 min.	213 licks	14.2 min.
Candy and wrapper images taken from Bing.com						

When considering all subjects, an average of 175 licks in just over 14 minutes to the center was measured (range 148-198 licks; 12.2 to 15.5 minutes). Differences in the number of licks is hypothesized to be explained by flavor with orange being consumed quickest and with the fewest number of average licks. This pattern holds regardless of gender or time of day the class met.

While the pattern held consistent, gender does appear to play a role in the observed differences. Generally speaking, males tended to take about the same amount of time to the center but took the same or fewer licks. This may be due to males' generally larger oral cavities and larger tongues.

Greater differences in results by time of day is supported by correlation with when respondents said they last consumed food. The first class of the day, right after breakfast, translated into the most licks and time to center. The fewest licks to center are associated with midday between lunch and dinner.

An examination of other collected information indicated that eye color was not indicative of differences in average number of licks to the center. Similarly, handedness was also not associated with meaningful differences in observed behavior, although with 88% of respondents right-handed and only one ambidextrous the numbers needed for a more exacting analysis will have to wait for another study.

CONCLUSIONS

The key to definitive research is replicability. Unfortunately the current result of 175 licks to the center of a Tootsie Pop comes only most closely to that from the students at Swarthmore Junior High School. And with their range from 70-222 licks there may be a methodology issue not reported that explains the range. There is no way to know from the reporting on their result. And without details as to their methodology or control factors it can't be considered especially reliable.

While the current study may not be definitive, due to its methodology, consideration of alternate factors, and ultimate controls, it appears the frontier of understanding is that approximately 175 licks is needed to reach the center of a randomly selected Tootsie Pop by a typical college student. A more standardized answer relies more on individual factors including but not limited to tongue moistness, lick duration, tongue texture, and the diameter of the pop itself. In considering this research result there must be an acknowledgement that differences due to flavors is involved. Consequently, while the current researchers do not agree with the commercial voice over announcer that "the world may never know" how many it takes to the center of a Tootsie Pop, we believe our estimate is the most accurate and takes into account human behavior and dynamics. Readers, and instructors interested in a project for their classes to discuss consumer behavior, experimental design, result issues, etc. are encourage to conduct their own research.

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